

## NOTES ON *AXIOCERSES* (LEPIDOPTERA: LYCAENIDAE)<sup>1</sup>

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RECEIVED FOR PUBLICATION SEPT. 20, 1962

### ABSTRACT

Locality records are listed and distributions mapped and discussed for *A. harpax*, *bambana* and *amanga*. The first two are contiguous but allopatric, the equator roughly dividing them (*harpax* to the north). One exception is a possible widely disjunct occurrence of *bambana* in Upper Guinea. Subspecies of *A. harpax* are described: **efulena** (Cameroun) and **ugandana** (Uganda, eastern Congo). A genitalic key to species is given.

The three most widely distributed species of *Axiocerses* are *harpax* Fabricius, *bambana* Grose-Smith and *amanga* Westwood, yet until recently (Stempffer 1957: 217, ff.) their correct identification was practically impossible. The first two, *harpax* and *bambana*, are so similar externally that they are effectively inseparable; and, though all three are subject to seasonal variation, in *amanga* this is so marked that the wet season and dry season forms have been considered distinct species.

Stempffer has shown that by means of the male genitalia all three species are readily and unequivocally identifiable, thus providing the means for distinguishing *bambana* and *harpax*, and uniting the seasonal forms of *amanga*. He has also provided an extensive list of localities for each species. These, combined with a number of additional localities in Carnegie Museum, provide a basis sufficient for a preliminary description and analysis of their distribution and, in the base of *harpax*, of regional variation as well.

#### *Axiocerses harpax* Fabricius

This species occupies a curious range (fig. 1, open circles): a band of territory from ocean to ocean, bounded to the south approximately by the equator, to the north about by the parallel of 15°. There are few or no records from the center of this band, but this is due, in all probability, to insufficient collecting. The known subspecies—there are four of them—are also curiously apportioned within this area. A narrow strip along the northern edge, from Senegal to Ethiopia and Eritrea, is occupied by the

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<sup>1</sup> Published pursuant to work as collaborating investigator on National Science Foundation grant no. G-14048.



Fig. 1. Distribution of *Axiocerses harpax* (open circles) and *A. bambana* (solid triangles). Questioned spots indicate uncertainty of precise location and (*harpax* from Ubangi) uncertainty of correct subspecies assignment as well. The dashed lines separate approximately the subspecies of *harpax*: a, *kadugli*; b, *harpax* s.s.; c, *efulena*; d, *ugandana*. The subspecies of *bambana* are not distinguished.

savanna subspecies, *kadugli* Talbot. In addition to the localities given by Stempffer (1957), Carpenter (1935: 392, under *harpax*) records it from a number of places in the northern half of Ethiopia and (*teste* Joannis and Verity) in Eritrea. I have seen no specimens.

The remaining three subspecies are distributed, successively from west to east, from the Guinea Republic to Kenya in the rainforest belt.

*A. harpax harpax* Fabricius (= *harpax piscatoris* Clench 1943). Male. The fore wing above has the discal cell usually without the distal quadrate

orange patch; cell  $Cu_2-2A$  is black in the base distad to about the origin of vein  $Cu_2$ ; distad of the postmedian spots in  $M_3-Cu_1-Cu_2$  there is no orange red; the postmedian spot is present in  $Cu_2-2A$ , as a heavy black bar, crossing the costal half of the interspace. On the hind wing above there is extensive black on the costa and black fills the discal cell. Female. Similarly characterized by extension of black: the fore wing above usually lacks the distal quadrate orange spot in the discal cell; the base of cell  $Cu_2-2A$  is black distad at least as far as origin of  $Cu_2$  and often as far as the postmedian bar; the costa is black inward to  $M_1$ , often more. On the hind wing the costal black is heavy, extending inward to  $M_1$  at least.

The above description is based on specimens from Liberia as follows: Cape Palmas (*leg.* Naysmith), Harbel, Bomi Hills, Fish Lake and Wanau Forest (all *leg.* R. M. Fox). An additional pair of specimens is at hand from Accra, Ghana. Stempffer adds localities in Republic of Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Dahomey and Nigeria. All are probably referable to this subspecies, but Nigerian specimens (Stempffer *in litt.*) show a mixture of characters implying transition to the next subspecies. In the Ghana pair mentioned above there are also slight indications of this, suggesting that the zone of transition is a rather large one.

*A. harpax efulena*, new subspecies.

Male. Fore wing above always with an orange red quadrate patch in distal end of discal cell; cell  $Cu_2-2A$  orange red to base, darkening progressively basad, but not black; the postmedian spots in  $M_3-Cu_1-Cu_2$  usually (71%) with orange red spots immediately distad; the postmedian spot in  $Cu_2-2A$  usually absent entirely, present in 22% of the specimens as a small trace only; hind wing above with costa only narrowly black and discal cell usually dark orange red with distal patch of bright orange red. Female. Fore wing above with distal quadrate orange spot always present in cell; cell  $Cu_2-2A$  in base dusky orange as far as origin of  $Cu_2$  (never black), and dusky never extends to postmedian spot; the costa is never black inward of  $M_1$  and usually there is some orange distally in  $R_5-M_1$ . On the hind wing above the quadrate orange spot always present in cell; costa with some orange always costad of  $M_1$  distally.

Holotype male, Efulen, Cameroun, 27. ii. 1926 (*leg.* H. L. Weber) (male genitalia slide C-834); 110 paratypes, all Cameroun, as follows: Efulen, 36 males, 22 females, various dates (see below); Elat, 28 males, 11 females; Metet, 5 males, 1 female; Ebolewa, 2 males; Olama, 65 mi. ENE of Lolodorf, 1 male; Sakbayeme, 1 female; Sangmelima, 1 female; Bitje, Ja R., 1 male; Yoko, 1 female. C. M. Ent. type series no. 443.

Remarks. The distribution by dates of the Efulen series (including holotype and allotype) is as follows, the numbers following each month being respectively of males and of females: January, 2, 0; February, 5, 1; March, 3, 3; April, 3, 4; May, 4, 3; June, 2, 0; July, 2, 0; August, 1, 0; September, 1, 2; October, 11, 3; November, 2, 1; December, 1, 0. There thus appear to be two major flights, one cresting at about March or April, the other in October, the earlier one apparently more prolonged.



*A. harpax ugandana*, new subspecies.

Male. Fore wing above always with a quadrate orange red patch in distal end of discal cell; cell  $Cu_2-2A$  black in base, distad to origin of  $Cu_2$ ; the postmedian spots in  $M_3-Cu_1-Cu_2$  usually (60%) with orange red spots immediately distad; the postmedian bleak spot in  $Cu_2-2A$  present and strong in all specimens, almost completely crossing the interspace in two, crossing apical half in two, and about one-third in one. On the hind wing above the quadrate orange spot is always present in the cell; costa always with some orange costad of  $M_1$ , and usually it is mostly orange.

Holotype male, Bugoma Forest, Unyoro, Uganda, iv. 1961 (*ex* T. H. E. Jackson) (slide no. C-918); 3 male paratypes: 1, same data as holotype; 2, Queen Elizabeth Park, Uganda, iii. 1961 (*ex* T. H. E. Jackson). C. M. Ent. type series no. 444.

Remarks. In addition to the type series there is at hand a male (slide no. C-836) from Medje, eastern Congo, vii. 1916 (*leg.* Lang and Chapin; *ex* American Museum of Natural History). Stempffer (1957:220) has recorded specimens from Ubangi (Talinga [=Yalinga ?]), northeastern Kenya and southern Ethiopia which with varying probability may refer to this subspecies. He also has noted (*in litt.*) its occurrence at Ngorongoro, Tanganyika, over 3° south of the equator.

*Axiocerses bambana* Grose-Smith

The following localities are represented in the Carnegie Museum collection: Congo: vic. Leopoldville; Angola: Gauca, 3600 ft. (ca. 20 mi. E of Quanza R. [nr. Neves Ferreira]); Chitau (Bihé Distr.); Nyasaland: Cholo, 2700 ft.; Ruo R.; Katanga: Elizabethville; Tanganyika (NE): Urungura Mts., 3000 ft. (ssp. *styx* Rebel). "Sierra Leone ?" (no further data). Stempffer (*in litt.*) adds the locality Cucumbi (prov. Lunda), Angola.

The principal portion of the range of this species (Fig. 1, solid triangles) lies wholly to the south of the area occupied by *harpax*, extending therefore from about the equator south into South-West Africa and the eastern Cape region. Nowhere does it overlap the range of *harpax*, but there are two potential zones of contact or near contact that deserve mention. First, in Kenya records show only *harpax* in the northwestern region; only *bambana* in the southeastern corner. Captures in the rather narrow intervening area (say, roughly, from Nairobi to Voi) might be very instructive. Second, along the west coast, only *harpax* is known from southern Cameroun; and from the vicinity of Leopoldville, on the Congo River, only *bambana* has been taken. It is curious, and perhaps significant, that despite large collections in Carnegie Museum from Gabon and Spanish Guinea there are no specimens from there of either *bambana* or *harpax*.

Does *bambana* occur in Upper Guinea? That question is raised by a few specimens of questionable authenticity. Stempffer (1957) mentions two of them—Sierra Leone and Gold Coast (Ghana). In a recent letter he writes that he has but one specimen from each, both from old collections and the data not beyond suspicion. In Carnegie Museum there is a pair, male (slide no. C-943; fig. 3B) and female, both labelled "Sierra Leone ?". These too

are old specimens and the data are doubted even on the labels. Adding to the interest of this problem is the fact that *A. amanga*, with a distribution (see below) strikingly similar to that of *bambana*, is definitely known to occur in Upper Guinea.

*A. bambana styx* Rebel. Stempffer (1957: 219) apparently did not know this subspecies and assigned it tentatively to *bambana* on the basis of its geographical location (Mt. Magara, Tanganyika, near Zanzibar). Two males are at hand (data given above) and the male genitalia of one of them show that it is indeed a *bambana*. The subspecies is quite distinctive. The orange red on the fore wing above extends no further costad than the middle of the  $Cu_2$ -2A interspace, the remainder of the wing being almost jet black. Elsewhere *bambana* males vary—individually—in the extent of the fore wing orange, but in the most extremely reduced of them the orange red still reaches vein  $Cu_2$ , and broadly; while the surrounding area of the wing, as usual in *bambana*, is dark grayish and shows the postmedian spots contrastingly darker even when they are not edged or surrounded by orange. The subspecies *styx* appears to have a very restricted range indeed. A short series of *bambana* from Mombasa, Kenya, very near *styx* territory, is nonetheless perfectly conventional *bambana*.

*A. bambana* subspecies. Stempffer (1957: 219, 220) mentions specimens from the arid region of northern South-West Africa as having the orange above light and the under surface dull: apparently a deserticolous form analogous to *harpax kadugli*. I have seen no material.

#### *Axiocerses amanga* Westwood

Localities in the Carnegie Museum collection: Congo: vic. Leopoldville; Angola; Huambo, 5400 ft. (Benguela Distr.); Chingaroi [Chinguar?], 2200 ft. (Benguela Distr.); Gauca, 3600 ft. (20 mi. E. of Quanza R. [nr. Neves Ferreira]); Transvaal: Messina; Rhodesia: Victoria Falls; Mineni Valley, Manica; Nyasaland: Cholo, 2700 ft.; Katanga: Elizabethville; Kenya: Mombasa; Kakamega; Cameroun (NW): Genderu, 4600 ft. [ca. 60 km. N. of Banyo] (ssp. *borealis* Auriv.). Localities in Natal and Transvaal are given by Swanepoel (1953: 163); Carpenter (1935: 392) gives localities in Ethiopia.

*A. amanga*, generally speaking, is considerably less common than either *harpax* or *bambana* (cf. Swanepoel 1953: 163) and records are correspondingly fewer. As with *bambana* its distribution (fig. 2) may be divided for purposes of discussion into two parts: the principal range, south and east of the Congo River; and Upper Guinea-Adamawa. The principal range is predominantly East African, extending from southern Ethiopia south to Natal. It reaches the west coast only from Angola to the Congo River. This range is similar to that of *bambana* save that in the east it extends considerably farther north, overlapping the range of *harpax* in and near Kenya, and does not extend quite so far south.

The range in Upper Guinea is still very inadequately known. Stempffer's records place it from the interior of Rep. Guinea eastward to Upper Volta and perhaps Soudan (Gao, on the middle Niger R.). To the east of these

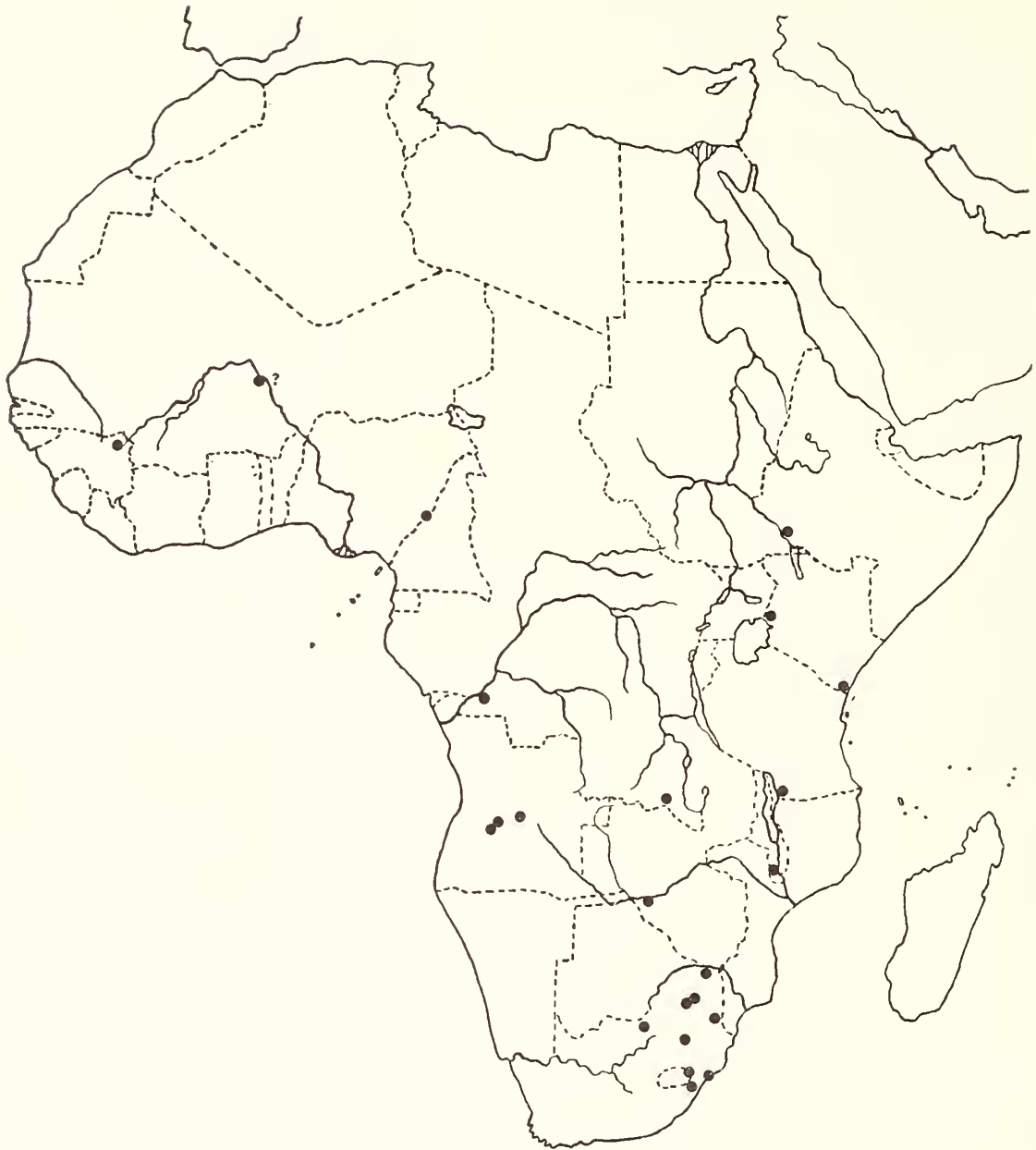


Fig. 2. Distribution of *Axiocerses amanga*. The question indicates a locality, Gao, Soudan, cited by Stempffer and indicated by him as questionable.

localities occurs an apparently isolated population in the Adamawa highlands, described by Awrivillius as ssp. *borealis*. These highlands have yielded a remarkable assemblage of East African species (cf. Clench 1961: 58).

In view of the striking difference in appearance of the forms "mendeche" and "amanga" and of insufficient knowledge of the dates and places where they fly it is worth mentioning that both forms are represented in the museum collection, in series, from Angola: form "mendeche" from Chingaroi, 2200 ft., i. xii.1930; form "amanga" from Guaca, 3600 ft., 1-6.i.1931, and from Huambo, 5400 ft., 9.ii.1931. All these dates fall in the middle of the rainy season, so the difference here must lie in elevation: the "wet" form



"amanga" from the well watered highlands, the "dry" form "mendeche" from the considerably more arid lower elevations.

Subspecies of *amanga* are still virtually unstudied. Stempffer suggests that the Upper Guinea specimens before him differed slightly from "mendeche" from elsewhere, but he lacked sufficient material to be positive of it. The subspecies *borealis* differs, if the single male at hand is typical, in having the discal orange of the fore wing somewhat narrower and, particularly, in this orange not extending distad around vein 2A; below the basal silvery streak on the costa is noticeably thinner and shorter. In the limited material at hand Kenya males have an orange patch in the fore wing discal cell above, absent generally in those from elsewhere. More material must be seen to determine whether or not this warrants formal recognition: a remark that obviously applies to the other populations mentioned above as well.

#### Other *Axiocerses*

In addition to the three species discussed above the following species are also known to belong to *Axiocerses*: *jacksoni* Stempffer, 1948 (Ethiopia); *argenteomaculata* Pagenstecher, 1902 (Ethiopia); *punicea* Grose-Smith, 1889 (southern Kenya to eastern Rhodesia), *baumi* Weymer, 1901 (Angola). Of these I have seen only *punicea*, but Stempffer's description of *jacksoni* (1948: 191, fig. 2) includes illustration of the male genitalia, permitting inclusion of this species in the key below.

The genus would appear divisible into two groups: one, including *jacksoni* and *argenteomaculata*, smaller, "washed-out" in appearance, and apparently confined to Ethiopia. Possibly, as implied by *jacksoni*, the absence of a short process from the falcular elbow is characteristic of this group. The other group includes all the rest: larger, redder (especially below) and all of them I have seen have a characteristic short ventral process from the elbow of the falx; their distribution as a group extends as far north as Ethiopia but reaches its greatest development in the eastern and south-central areas of the continent.

The genus is above all an inhabitant of the savanna and thorn scrub country. Only *harpax* appears to have invaded the rain-forest.

#### Genitalic key to *Axiocerses*

Note: *baumi* Weymer and *argenteomaculata* Pag. not included.

- 1 a. Falx regularly rounded at elbow, without process.....*jacksoni* Stempff.
- b. Falx abruptly and sharply angled at elbow, with a short ventral process there .....

- 2 a. Mesial cleft of fultura inferior extends anteriorly to approximately the level of the dorsal cross-connection of the valvae, and well proximad of the lateral shoulders of the valvae, which may or may not be distinct ..... 3
- b. This cleft extends anteriorly only to about the level of the distinct lateral shoulders of the valvae, well distad of the dorsal cross-connection of the valvae ..... *punicea* Gr.-Sm. (fig. 3A)
- 3 a. Arms of fultura inferior long and digitate, roughly coterminous with distal ends of valvae; lateral shoulders of valvae very pronounced ..... *amanga* Westw. (fig. 3D)
- b. Arms of fultura inferior distinctly shorter than valvae; lateral shoulders of valvae not prominent ..... 4
- 4 a. Fultura inferior very short, its arms rounded, lightly or not at all toothed, ending about opposite lateral shoulders; dorso-mesial edge of valva usually with a slight, rounded, toothed process just distad of cross-connection ..... *bambana* Gr.-Sm. (fig. 3B)
- b. Fultura inferior longer, its arms acute, usually densely toothed, ending just short of distal ends of valvae and distinctly beyond shoulders; no toothed process on dorso-mesial edge of valvae  
*harpax* Fabr. (fig. 3C)

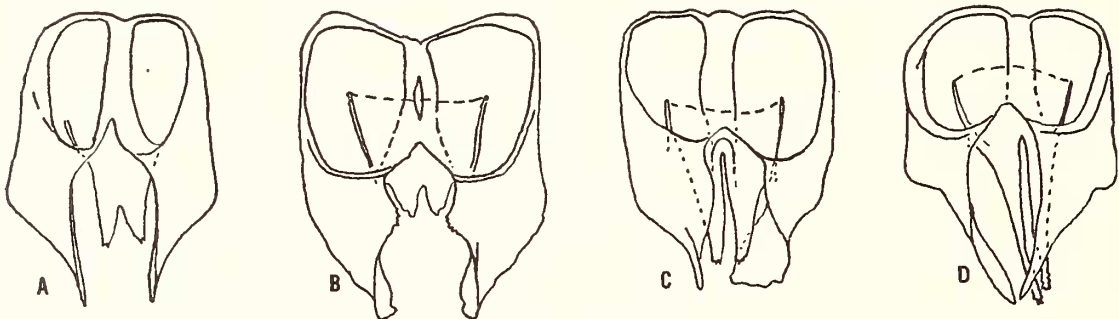


Fig. 3. Male genitalia (valvae, in dorsal view) of *Axiocerses*: A, *punicea* (Mombasa, Kenya); B, *bambana* (Sierra Leone?); C, *harpax* (Liberia); D, *amanga* (Angola).

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